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Title:	PF-4 Seismic Reassessment Project (P-SPRaP), Interim Risk Methodology and Deliverables
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PF-4 Seismic Performance Reassessment Project (P-SPRaP)

Interim Risk Methodology and Deliverables

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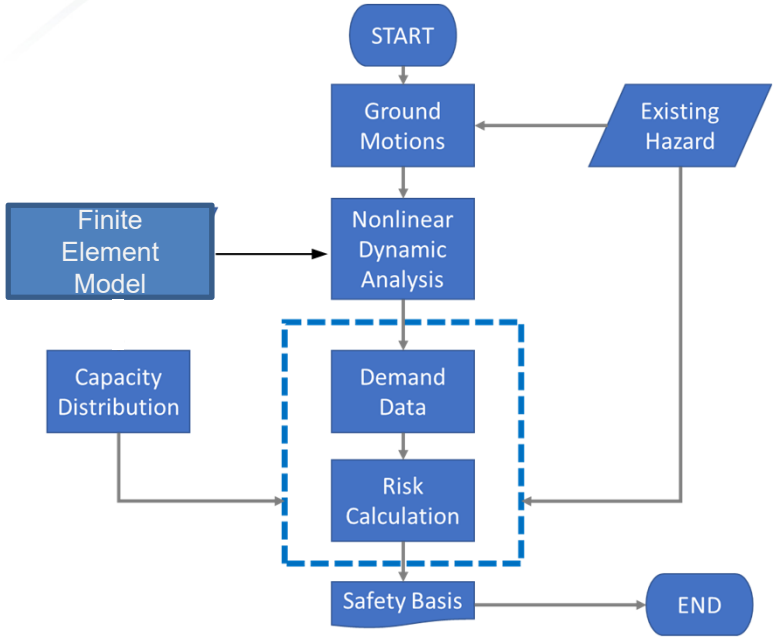
Introduction

- **Background:**
  Interim Risk was added to P-SPRaP (SPR Phase 2) to produce intermediate results which build confidence, exercise methodology, develop early insights, and (most importantly) mitigate LANL pit production program risk.

- **Status:**
  SPR Phase 2 is actively underway, has P-SPRaP project team priority focus, and is targeting completion in FY21 (September 2021).

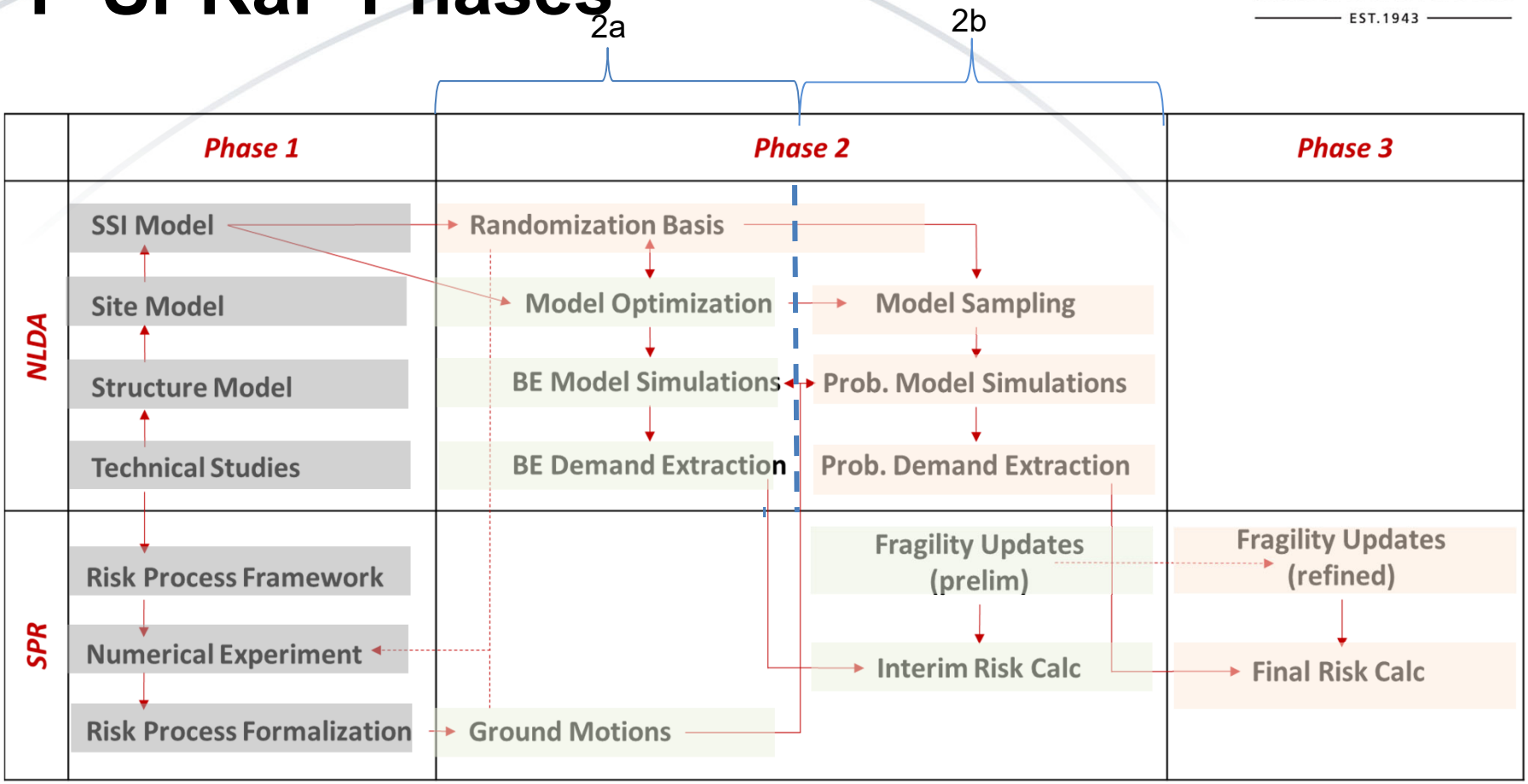
- **Deliverable:**
  Presentation of interim risk results (loss of confinement for screened in failure modes), list of potential criticisms of Interim Risk approach / methodology that intervenors could raise, cost and schedule for completion of Final Risk

P-SPRaP Framework

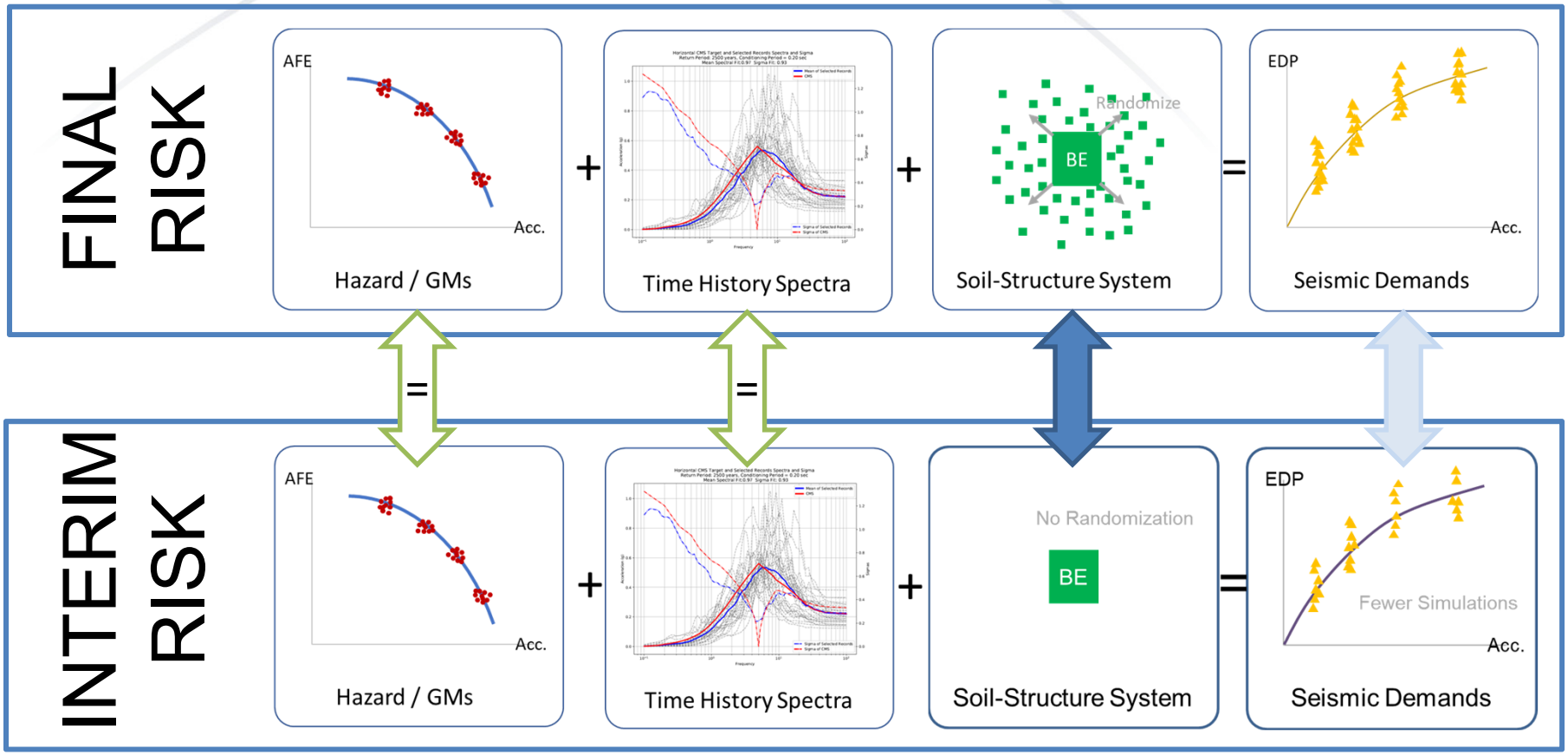


- Ground motions across range of seismic hazard
- Nonlinearity in soil and structure behavior
- Component-level seismic performance and EDPs
- Probabilistic capacity estimates (fragilities)
- Explicit risk computation

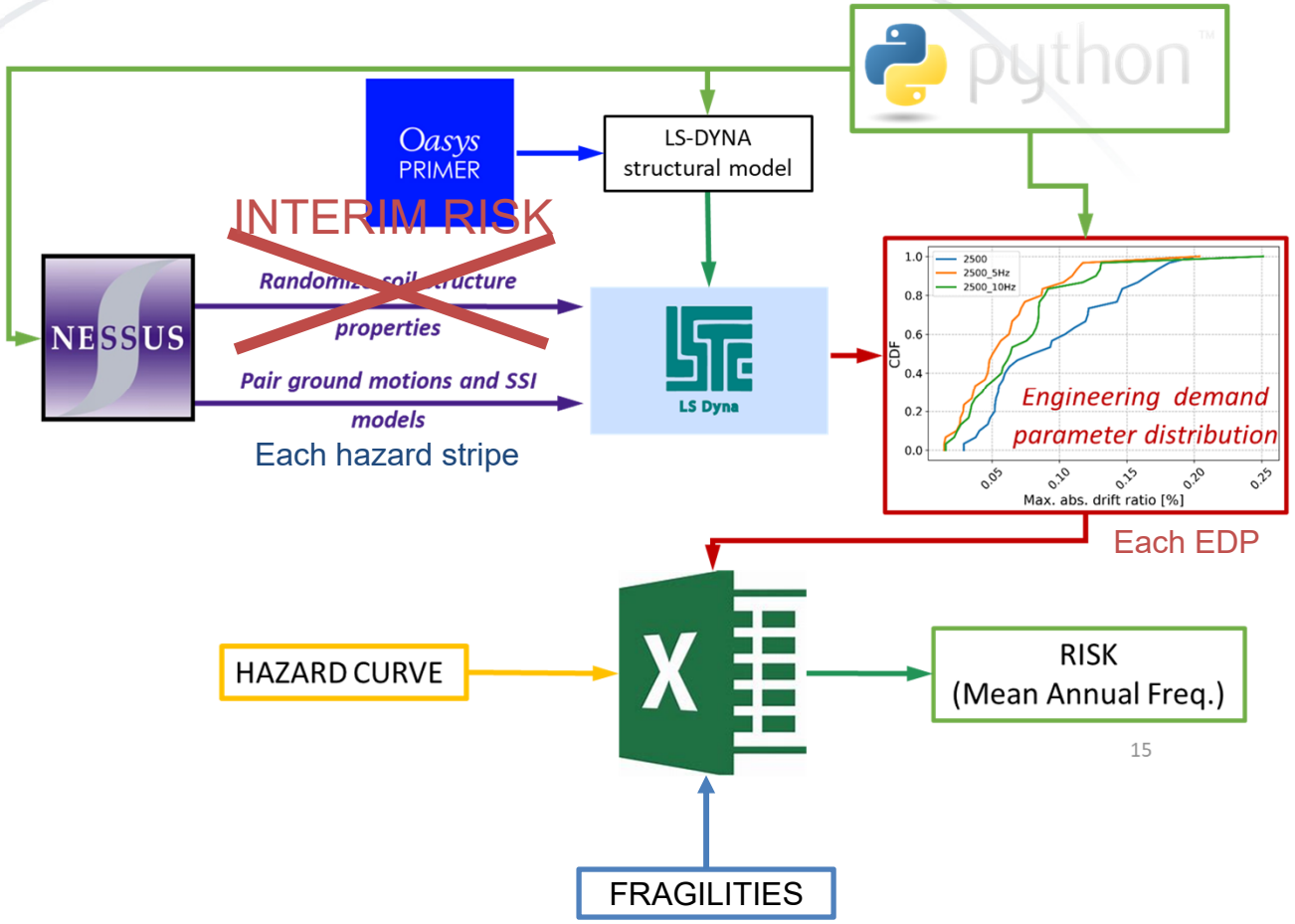
P-SPRaP Phases



Interim vs. Final Risk



Computation Workflow



Interim vs. Final Risk

Feature	Final	Interim	Notes
BE SSI Model	✓	✓	Same nonlinear BE SSI model
HPC Simulations	✓	✓	Same computing system for both
Risk Calculator	✓	✓	Same tool for both
Multiple EDPs	✓	✓	EDPs for each failure mode
Fragility Capacities	✓	✓	Preliminary for Interim Risk
Hazard Stripes	✓	✓	Preliminary for Interim Risk
GM Variability	✓	✓	GM suite for each of 4 UHRS
Structure Variability	✓		None for Interim Risk*
Soil Variability	✓		None for Interim Risk*
* Considering estimating via sensitivity study to include approximate effect			

Known Limitations of Interim Risk

#	Limitation	Mitigation
1	Not considering soil / structure variability will under-estimate risk.	Sensitivity study being considered to quantify and/or include the effect.
2	Process and products are not peer reviewed.	In-process result only, not intended for reference in Documented Safety Assessments, meant as preview for Final Risk only. Final Risk is peer reviewed.
3	Software and calculations not performed per nuclear QA standards.	In-process result only, not intended for reference in Documented Safety Assessments, meant as preview for Final Risk only. Final Risk may be per nuclear QA.
4	Fragility capacities are preliminary.	Preliminary fragilities are conservatively biased. Interim Risk results inform fragility refinement.
5	Hazard stripes may not be optimal for all EDPs.	Interim Risk informs governing failure mode(s) and dominating hazard level(s) for Final Risk focus.
6	No insights gained on soil/structure RV importance.	Randomization Refinement study is performed in parallel for this purpose, leveraging other SSI runs.

Intended Use of Interim Risk

- **Provides project sponsors (NNSA/WIPO) with preview of what Final Risk numbers may be**
- **Mitigates TA-55 program risk for other programs**
- **Is not intended to be used as updated QA pedigree reference for DSA use**
- **Proves nonlinear fragility framework to be used in either Final Risk or other NNSA projects**
  - UPF
  - MOX Repurposing
- **Cost/Schedule with IR results may be used by decision makers on funding Final Risk**